THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 13

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte SCOTT R. SUMMERFELT

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Appeal No. 96-0859
Application No. 08/252,727[1]

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ON BRIEF

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Before KRASS, JERRY SMITH and BARRETT, Administrative Patent Judges.

KRASS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1 through 14, all of the claims pending in the application.

[1]Application for patent filed June 2, 1994.

The invention pertains to integrated circuits and, more particularly, to structures within integrated circuits, such as capacitors, which employ sacrificial oxygen sources in order to prevent reduction of oxygen containing materials. Maintaining a high dielectric constant is essential in order to build smaller capacitors while maintaining the same capacitance. Many high dielectric constant materials depend for their electrical properties on their oxygen content. Yet, the many fabrication steps in the manufacture of DRAMs and other structures generally reduce high dielectric constant materials which contain oxygen resulting in a degradation or nullification of their advantageous electrical properties. Accordingly, the instant invention is said to provide for the prevention of reduction of oxygen containing dielectric materials during VLSI processing through the use of sacrificial oxygen sources provided near the oxygen containing material and subject to certain requirements, disclosed at page 4 of the specification.

Representative independent claim 1 is reproduced as follows:

1. A structure in an integrated circuit, said structure comprising

a substrate;

a lower electrode comprised of electrically conductive oxygen source material on said substrate;

a layer of oxygen-containing dielectic material on said lower electrode; and

an upper electrode in contact with said layer.

The examiner relies on the following references:

Rodriguez et al. (Rodriguez)	3,274,468	Sep. 20, 1966
Short	3,798,516	Mar. 19, 1974

Claims 1 through 14 stand rejected under 35 U.S.C. 103 as unpatentable over Rodriguez and Short.

Reference is made to the briefs and answer for the respective positions of appellant and the examiner.

OPINION

We reverse.

At the outset, we note, in passing, that while we generally agree with appellant’s position, we find

unpersuasive appellant's argument [principal brief - page 9] that both Rodriguez and Short are directed to monolithic capacitors while the instant invention is directed to integrated circuits. Column 1, lines 10-15, of Rodriguez, indicating a desire for miniaturization of components within printed circuits, would clearly have led the skilled artisan to apply the Rodriguez teachings to integrated circuits.

The examiner's rationale for the stated rejection is, in toto:

> Rodriguez teaches a typical capacitor structure having a pair of electrodes of a material "that will not melt or oxidize" such as platinum or palladium surrounding an oxygen containing dielectric such as barium strontium titanate (see columns 2-3). Although Rodriguez teaches a material "that will not melt or oxidize", it is well-known to those of ordinary skill in the art that platinum or palladium do in fact oxidize externally. Short is cited as showing titanates are commonly supplied with oxygen additives. Rodriguez being cited in Short, the references are considered an analogous combination [answer - page 3].

Thus, the examiner employs Rodriguez for a teaching of the use of materials which will not oxidize when the point of the instant invention, as claimed, is to use materials which will oxidize so as to prevent reduction, i.e. loss of oxygen, of the dielectric which is composed of materials which do

oxidize. The examiner then appears to employ Short to explain that despite Rodriguez' teaching, platinum and palladium do oxidize. We find nothing in Short which contradicts anything taught by Rodriguez. However, notwithstanding whether Short and Rodriguez are in conflict, the examiner has clearly failed to set forth a prima facie case of obviousness in that the examiner has failed to address key claim limitations.

Each of the independent claims calls for, in one form or another, an "oxygen source material." This term is specifically defined at the top of page 11 of the specification as "a material with oxygen partial pressure $P_R(O_2)$ which is greater than the partial pressure at which the oxygen-containing dielectric is reduced, referred to herein as the critical partial pressure $P_C(O_2)$." Claim 14 specifically recites functional language attached to the recitation of the oxygen source material such that "partial pressure of oxygen at all points in said dielectric is sufficiently high to prevent reduction of said dielectric." Yet, the examiner never appears to come to grips with this language. The examiner has pointed to nothing in the applied references which provide for the claimed "oxygen source material."

At the bottom of page 4 of the answer, in discussing instant claim 14, the examiner appears to indicate that the oxide dielectrics of the prior art are being equated to the claimed "oxygen source material." However, merely because oxide compounds have oxygen as a component thereof, this does not make such compounds "oxygen source material," as claimed and as specifically defined in the specification. Moreover, with regard to claim 14, even if the applied references showed an "oxygen source material, as defined in the instant specification," used as the dielectric, which it does not, claim 14 requires the "oxygen source material" to be "disposed nearby" the capacitor and not to be part of the dielectric since the dielectric is recited separately.

Accordingly, since the examiner failed to present a prima facie case of obviousness, taking all claim limitations into account, we will not sustain the examiner's rejection of claims 1 through 14 under 35 U.S.C. 103.

The examiner's decision is reversed.

REVERSED

ERROL A. KRASS Administrative Patent Judge	)	
JERRY SMITH Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
LEE E. BARRETT Administrative Patent Judge	)	

Chris D. Plyant
Texas Instruments Inc.
P.O. Box 655474, M/S 219
Dallas, TX 75265